Response to Comments Document

Benthic Total Maximum Daily Load (TMDL) for Toms Brook in Shenandoah County, Virginia

Introduction

A final public meeting was held for the Toms Brook benthic TMDL on January 13, 2004. The draft TMDL report (Benthic Total Maximum Daily Load (TMDL) for Toms Brook in Shenandoah County, Virginia) was presented at the meeting and made available on the DEQ website. A public comment period on the draft report was held from January 13, 2004 until February 12, 2004. During the public comment period, four individuals submitted comments. The comments from each commenter are presented below, followed by DEQ's response to the comment.

Comments Submitted by Henry Staudinger

Comment 1

On several occasions the Report states: "Because future land use change in the watershed was considered to be minimal, TMDL modeling for the allocation runs was performed using the existing land use in Toms Brook." (e.g., pp 4, 5, 14, 67)

This assumption does not take into consideration the tremendous development pressures that can be expected in the watershed in the coming years as Northern Virginia continues to move toward the county. At the same time the report proposes to exempt those sources from the remediation efforts. Construction of many new homes with individual septic drain fields, the addition of numerous small horse farms and other changes could substantially increase erosion and resulting sediment. Unless potential future land use is considered in the model, Toms Brook could remain impaired even if the contemplated BMP's are implemented.

Response

Based on verbal comments received at the public meeting and subsequent written comments, DEQ has changed the TMDL allocation scenario selected in the report. Allocation Scenario #1 was selected instead of Allocation Scenario #3. This allocation scenario calls for equal sediment reductions of 14.3% in each of the following source categories: agriculture, urban, forestry, and channel erosion. This scenario provides a more equitable distribution of the reductions between sources. This scenario also addresses the commenter's concern that future land use changes might be exempt from remediation efforts. Because required reductions are equal across land uses, conversion of any of the current land uses to another land use would still be subject to the same reductions.

Comment 2

The Toms Brook benthic impairment is based on an average SCI of 60.0, whereas the "current DEQ-proposed classification for benthically "unimpaired" streams [is] (SCI > 61.9). The draft is silent as to whether this standard will meet EPA and Virginia requirements now or in the future. It also silent as to the expected Toms Brook SCI score in the event the proposed sediment reduction is achieved.

From the Report, readers could easily infer that unimpaired status could be achieved with a much smaller reduction. For example, the adjusted Hays Creek comparative watershed had a

SCI score of 64.4. If Toms Brook's sediment were reduced by 237 tons, it would have the same sediment load as Hays Creek and a SCI score of 64.4 appears to result.

However, DEQ personnel insist that there is no direct relationship between the amount of sediment and the SCI score. Since DEQ will be using SCI scores, it is important that in its Report it set forth the expected SCI score for Toms Brook if the recommended sediment reduction is achieved.

Response

The TMDL sediment load for Toms Brook was developed using the reference watershed approach. This means that the TMDL sediment load for Toms Brook is set at the sediment load of a similar, area-adjusted reference watershed that is unimpaired. Using this method, it is not possible to anticipate an exact benthic score after TMDL implementation, other than the expectation of a "non-impaired" condition. Implementation of the TMDL will proceed in a staged or phased manner, where moderate implementation steps are followed by monitoring and then additional implementation as needed. Progress during TMDL implementation will be monitored not by the measurement of reduced sediment loads, but by the continued monitoring of the benthic community. TMDL implementation will be complete when the benthic community has reached an unimpaired state and the stream is removed from the 303(d) list. As the commenter suggests, this unimpaired condition may be achieved prior to reducing sediment loads to the TMDL level. If this occurs, then the TMDL has been successful and the goals reached prior to complete implementation.

Comment 3a

The Draft states: "The impaired section of Toms Brook includes the entire stream from its headwaters to its confluence with North Fork Shenandoah River." (pp 7-8). However, at p 17 the Report states: "TMB000.54 is the historical DEQ station used for both ambient and benthic data collection and was used as the basis for the impairment listing in 1998." This suggests that only the lower part of Toms Brook was documented as impaired.

Although the Report uses TMB000.54 as the impairment point, it is clear from the report that there are three distinct segments that may contribute quite differently to the impairment: (1) the segment above the STP discharge, (2) the segment from the STP discharge to a point above the confluence of Jordon Run, and (3) the Jordon Run segment.

Response

At the time that the impaired listing was designated for Toms Brook (1998), the only benthic monitoring station was near the mouth of Toms Brook (Station TMB000.54), just upstream from its confluence with the North Fork Shenandoah River. Locating benthic monitoring stations near the mouths of small rivers is very common, because results from such a site integrate all of the upstream influences in a stream. When a monitoring station that is located near the mouth of a stream indicates an impairment and there are no other monitoring stations on that stream, the entire stream is listed as impaired on the 303(d) list. This procedure is used because it is not possible to determine the upper extent of the impairment without additional monitoring sites.

During the TMDL study, additional benthic monitoring stations were located on the stream to provide more information on the potential location and source of the impairment. In addition to the benthic monitoring station located near the mouth of Toms Brook, two additional benthic monitoring stations were added in 2003. These benthic monitoring stations were located on Jordan Run (station JDN000.29) and on Toms Brook upstream of the confluence

with Jordan Run (station TMB000.70). During monitoring of these three locations in the spring and fall of 2003, benthic scores from all three stations were relatively consistent and did not clearly point to a stream segment that was more severely impaired.

DEQ will continue to monitor the benthic community at three separate locations on Toms Brook. As the commenter suggests, the current monitoring design does not include investigation of Toms Brook above the Sewage Treatment Plant (STP). For this reason, the monitoring design used in 2003 will be slightly modified in 2004. Beginning in 2004, a new benthic monitoring station will be located upstream from the STP. Monitoring will be conducted at this new station (upstream of the STP), at station TMB000.70 (between the STP and the confluence with Jordan Run), and at station TMB000.54 (downstream of the confluence of Jordan Run). This monitoring design will be able to individually investigate each of the three segments mentioned by the commenter and isolate any impacts distinct to those three segments.

In addition to monitoring that is being established in 2004, monitoring needs can again be re-evaluated at the time of TMDL implementation planning. Part of the implementation planning process is to establish a monitoring program that will assess the progress of implementation goals.

Comment 3b

At the same time the Draft includes several statements suggesting that Jordon Run may be a greater contributor to benthic impairment than the other two segments. For example, the Report states:

> "[I]n the most recent benthic sample (3/24/03)…Asellidae numbers had decreased back to 15 at the TMB000.54 station, and were also seen at the first Toms brook station upstream from its confluence with Jordon Run, TMB000.70, but not in the upstream station on Jordon Run – JDN000.29."

Since TMB000.54 was below the confluence of Jordon Run, the above statement suggest that Jordon run could be the major cause of the impairment. The Draft also does not distinguish between benthic impairment above the STP, between the STP and the point prior to the convergence of Jordon Run, and the section after the convergence of Jordon Run. This is critical information to be elicited before determining what action should be taken. For example, if the impairment is substantially greater below the convergence of Jordon Run than just above that point, it would be appropriate to focus more on Jordon Run BMPs.

Response

The excerpt from the TMDL report that is cited above regarding the presence of Asellidae, does not suggest that Jordan Run is the major cause of the impairment. Rather, the opposite is concluded. The cited excerpt is followed in the report by the following concluding statement, "This suggests that the pollution source causing the elevated Asellidae levels discharges to Toms Brook upstream of the confluence with Jordon Run." Asellidae are indicators of recovery from organic pollution, so their presence in Toms Brook and absence in Jordan Run indicated that sources of organic pollution may have originated in Toms Brook, rather than Jordan Run.

Comment 3c

There are also statements in the Draft suggesting that the STP could also be a factor in the benthic impairment of Toms Brook. However, assumptions were used to disregard the STP as a factor. For example, on page 35 it is stated: "Since the 2002 average daily flow from the

STP…comprised only 3.2% of the minimum flow from the station just upstream from the STP…the stream's ability to assimilate permitted STP flow and loads should not be a factor." However, this is merely an assumption and does not consider the impact of low flow years and other factors. It would be better to use a comparative benthic study at the three locations instead of relying on assumptions. This information could be critical in determining the most cost effective implementation plan.

Response

DEQ disagrees with the commenter's statement that assumptions were used to disregard the STP as a factor in the benthic impairment. The report concluded that, "The perennial cold weather process upsets at the Toms Brook STP may contribute to the aggregate stress on the benthic community, but problems at the STP could not be definitively linked to the impairment." Benthic scores before and after each plant upset were investigated to determine if the STP could have caused the decreased benthic scores. Except for the December 2001 upset, all other upsets were followed by an improved benthic score (relative to the preceding benthic score measured prior to the upset). Based on the available data, the STP was not determined as the primary cause of the impairment. Nevertheless, it is DEQ's responsibility to ensure that all permittees remain in compliance with State discharge permits. For this reason, the report also concludes that, "The cause of the STP upsets will continue to be investigated cooperatively by DEQ, the facility, and its consultants. In addition, operations and maintenance controls will continue to be implemented to avoid such upsets and to ensure continued compliance with all permitted ammonia, BOD, and TSS limits."

Comment 4a

In its Model, DEQ should take into consideration potential land use changes.

Response

See response to Comment 1.

Comment 4b

DEQ should monitor at the three distinct segments separately to better understand how much each segment is contributing to the benthic impairment so that a cost effective implementation plan could be developed.

Response

See response to Comment 3a

Comments Submitted by Joan Comanor

Comment 1

Actual information about the sources of sedimentation affecting the benthic invertebrates is quite limited due to the short term monitoring and few monitoring sites in the watershed. It is essential that next steps at developing and implementing a TMDL plan must begin with more comprehensive monitoring sites and commitment for a scientifically valid monitoring plan with sustained sampling for the ten year implementation period.

Response

See response to Comment 3a submitted by Henry Staudinger.

Comment 2

Results from actual monitoring should be used to refine the modeling used as part of the TMDL study and refinement of using a reference watershed for assigning load reductions.

Response

For sediment TMDLs that address benthic impairments, monitoring efforts are not focused on measuring sediment. Because the impairment is based on monitoring of the benthic community, the benthic community itself is used as the direct measure of TMDL success. TMDL implementation will be complete when the benthic community has reached an unimpaired state and the stream is removed from the 303(d) list.

Comment 3

The implementation plan must apply to all land uses (existing and projected) in the watershed, particularly given expected future change toward more residential housing and related development in rural areas and expansion of built-up areas. Best management practices for each of the major land use categories should be developed and included in the implementation plan.

Response

See response to Comment 1 submitted by Henry Staudinger.

Comment 4

Actual information derived from the recommended water quality monitoring plan should be provided to Shenandoah County and the community of Tom's Brook so that it can be appropriately included in updates to county land use plan and local zoning and building codes and regulations.

Response

DEQ agrees. During the Implementation planning process, DEQ and DCR will work closely with the local governments, and all applicable information will be shared, including monitoring results.

Comments Submitted by Rob Arner

Comment 1

First I wish to applaud DEQ for promoting public involvement in this delicate process. Both the Chesapeake Tributary Strategies and TMDL are showing how essential stakeholder involvement is to combat non point pollution. While Toms Brook is not significantly impaired by sediment as other Virginia TMDL watersheds developing public involvement and promoting sustainable land use practices are fundamental.

As a Pollution Prevention Specialist for Southeast RCAP I have promoted citizen household water testing, septic corrective action, and host of other water quality improvements with the Shenandoah Water Resources Committee and Toms Brook/Maurertown Sanitary District. Also I have served for on Lord Fairfax Soil and Water Conservation, Erosion and Sediment Subcommittee for three years. I am holding a workshop with this organization promoting filter soxs as an alternative to silt fences as an example of potential innovations to address the challenge of erosion control here in Virginia. It is estimated that soil erosion alone in this county costs from $2-8 billion dollars each year.

Promoting wiser erosion and sediment requirements can help shape future infrastructure, maintenance, and stormwater aspects that will affect the next generation here in Toms Brook. Pollution prevention pays: the better we can minimize run-off the more we can save our land, water and lessen clean-up expenses.

Toms Brook, like most places in the Commonwealth is walking upon the razors edge considering both future growth and sustaining of our present quality of life. This critical challenge provides us with a unique opportunity that "less is may equal more." Can we can work together to find common solutions to preserving our rural landscape? How we develop Toms Brook will impact future sediment pollution. Proper land use planning, design and zoning may provide greater economic savings if only we recognize how we all benefit.

Promoting better site design principles can help developers recognize increased economic benefits through reduced infrastructure requirements (i.e. decreased need for clearing and grading of sites, and less expenditure to meet stormwater management requirements due to reduced runoff volumes and nutrient export from a site).

Such gain through the encouragement of better site design practices is illustrated below:

∗ Studies have found that construction savings can be as much as 66% by using the open space designs encouraged by better site design (CWP, 1998a).

∗ Better site design can also reduce the need to clear and grade 35% to 60% of total site area. Since the total cost to clear, grade, and install erosion control practices can range up to $5,000 per acre, reduced clearing can be a significant cost savings to builders (Schueler, 1995).

How we allow our land to be developed can be a win/win situation if we exercise prudence. For example increased open space often increases property values and real estate premiums; therefore, it is to a developers' advantage to conserve trees and open space within a subdivision.

Cluster developments, which use better site design techniques such as tree conservation, reduction of impervious cover, increased common open space, and minimal clearing and grading, typically keep 40 to 80% of a site in permanent community open space and yield lots that bring a higher selling price. In addition, urban forests boost property values by reducing irritating noise levels and screening adjacent land uses.

Promoting five possible best management opportunities to promote future prosperity for Toms Brook are:

1) Watershed Planning – zoning tools, growth boundaries, source water Protection. * Reduction of drinking water treatment costs, health care costs, and restoration costs

2) Land Conservation – forest conservation, wetland protection, preservation of parks and open space * Reduction of energy costs, health care costs, flood control and stormwater quality and quantity treatment costs

3) Better Site Design – cluster development, impervious cover limits * Income from increased property values *Reduction of construction, maintenance, and

infrastructure costs, as well as stormwater and flood control costs

4) Erosion and Sediment Control – channel protection, clearing and grading, construction site erosion and sediment control * Income from increased property values* Reduction of drinking water treatment costs, construction costs, restoration costs, and stormwater treatment practices.

5) Stormwater regulations, floodplain protection – Income from increased property values ***** Reduction of flood damage costs, reduction of cost of structural stormwater and flood**.**

Finally, there are many unresolved questions regarding how we are going to be able to effectively develop TMDLs and Use Attainability Analysis (UAAs) for sediment control. Providing the statistical tests that give greater scientific validity in the UAA process that answer these questions are critical for improving the science and soliciting public participation in water quality improvements. How can we clean an impaired water body by sediment and how we develop a reasonable standard and how practical it is to *fully* restore one?

There are many issues in the TMDL process that we must examine both from a resource and technical perspective. If this is going to be a costly process diverting resources from other water improvement projects then we best integrate this into an umbrella watershed effort. Measuring reduction is a complicated challenge so we may wish to focus on more performance based measures such as installing best management practices.

As we enter into the TMDL implementation process we must introduce erosion best management practices and other achievable assurances to attain water quality standards. There are many additional considerations of going into a watershed and recruiting public support to abide by what the courts have ordered. Finally it is difficult to implement specific reduction measures until we first define practical sediment loads we are *able* to remove. Public support requires us to develop clear and simple directions of what is **possible** not what is *improbable*.

I appreciate the opportunity to present my comments to Virginia Department of Environmental Quality. It has been estimated by experts that water quality improvements in Virginia will cost billions of dollars to restore our waters. Let's best define and engage all Virginians to be a part of the solution to this complicated pollution control challenge. Otherwise our efforts will continue to be as murky as Virginia's water in attacking this societal environmental challenge.

Response

DEQ thanks the commenter for his support. DEQ agrees that practical and implementable best management practices (BMPs), such as those recommended by the commenter, should be implemented in the Toms Brook watershed. During the implementation planning process, these and other BMPs will be evaluated and discussed. In the end, implementation will rely on the willingness and combined efforts of the local community. DEQ will support these efforts in any way possible.

Comments Submitted by Joe Lehnen

Comment 1

I have been involved with the Toms Brook Watershed TMDL process from the beginning and I want to congratulate you, the folks at DEQ & DCR for the wonderful presentation that you provided us on Tuesday night. The research data was thorough, understandable and convincing that Toms Brook does indeed have a benthic impairment.

I would therefore like to add my support for the listing of Toms Brook & Jordan Run as impaired streams with the EPA.

Response

DEQ thanks the commenter for his support. DEQ would like to clarify one point mentioned in the comment. Only Toms Brook (and not Jordan Run) is listed on the 303(d) list of impaired waters. During previous assessment periods, there was no monitoring data on Jordan Run to base an individual assessment. Because Jordan Run is a tributary of Toms Brook, however, the TMDL is developed for the entire watershed, including Jordan Run.

Comment 2

I would like to differ with DEQ concerning the use of TMDL Alternative 3 as the favored clean-up program for this watershed. I feel that excluding the urban sedimentation contribution from this TMDL effort would send a mistaken message to the residents of the watershed that urban uses of the landscape are not a contributing problem to the sedimentation of this stream. Additionally, I envision further urbanization of this small watershed which very well could increase the sedimentation contributed by this land use. I believe that TMDL Alternative 1 would be my first choice in our approach to correcting the pollution problem in these two streams.

Response

See response to Comment 1 submitted by Henry Staudinger.